Backup Emergency Power for EmComms

It should be obvious that one's ability to provide radio communications is useless without an independent grid free power source. For most of us, this means battery power readiness; i.e., spare battery packs for our HTs, mobile, and portable radio equipment.

Normally, there are four kinds of batteries commonly utilized in ham radio, lead acid, NiCd (Nickel Cadmium). Ni-Mh (nickel metal hydride), and Li-ion) lithium ion. There exists volumes of details about the usage and composition of these batteries; which we will skip in favor of the essentials.

Different Battery Characteristics

NiCd (Nickel-Cadmium) batteries are common in older equipment; but are now replaced in newer radios with rechargable Ni-Mh or Li-ion batteries. A major disadvantage of NiCd batteries is the memory effect; which prevents deep cycling. Thus it is recommended to discharge the battery almost to 5% capacity periodically in order to defeat the memory effect.

Ni-Mh (Nickel-Metal Halide) batteries are not subject to the memory effect limitation and can be kept near fully charged without deleterious effects. They have a 10 year life span on average, depending.

Li-ion (Lithium Ion) batteries are now commonly issued with newer handheld radios. They also do not suffer from memory effect limitations and have the largest capacity, efficiency, and life span than its predecessors. They are temperature sensitive however; but generally considered far superior to lead acid or NiCd and outperform NI-MH batteries in most regards.

AGM Deep Cycle Batteries: For the home station during power outages a deep cycle battery of 105 AH capacity is useful. The newer Absorbent Glass Mat (AGM) batteries are preferred over standard lead acid batteries and gel cells. They are maintenance free and will not emit fumes when being charged. They are only slightly more expensive initially, than standard lead acid (flooded) batteries and less expensive in the long run, albeit their initial expense is higher.

AGM has very low internal resistance, is capable to deliver high currents on demand and offers a relatively long service life, even when deep cycled. AGM is maintenance free, provides good electrical reliability and is lighter than the flooded lead acid type. While regular lead acid batteries need a topping charge every six months to prevent the buildup of sulfation, AGM batteries are less prone to sulfation and can sit in storage for longer before a charge becomes necessary. The battery stands up well to low temperatures and has a low self-discharge.

The leading advantages of AGM are a charge that is up to five times faster than the flooded version, maintenance free, will not outgas, and offers the ability to deep cycle. AGM offers a depth-of-discharge of 80 percent; the flooded, on the other hand, is specified at 50 percent DoD to attain the same cycle life.

Devise a method to switch over to your deep cycle battery(s) to power your equipment during power outages. The use of Anderson Power connectors have become the defacto 12vdc interoperability standard. Fuse all power lines according to the ampacity of the wire gauge and connector ratings.

A detailed optimum charging methodology is altogether another topic of its own. It's worthwhile to research.

Other than keeping two or more spare battery packs handy for your handheld/portable equipment, know how to charge your batteries and/or operate your radio directly from your automobile battery cigarette lighter plug. There are two major commercially available types of cigarette plug accessories for most radios. One type is using a cigarette plug adapter to operate your radio. Another is using a cigarette plug to charge your batteries, while not operating. The best kind are cigarette plug adapters that can charge and operate the radio at the same time.

For this type of system to be renewable one needs to be able to recharge your automobile's main battery by turning on the car's the engine. That of course requires gas/fuel. A precaution that we all must consider is that gasoline service station pumps will not operate during a disaster because of widespread power outages (the gas pump needs electricity to run). Good operating practice is to never allow less than a 1/2 tank of gas/fuel at any one time. Solar voltaic power may be a wise long-term choice in a protracted disaster. For example a monocrystalline solar panel capable of 100 watts (approximately 7 AH/per hour at 15 volts nominal) combined with a quiet charge regulator should be adequate for portable operation of VHF/UHF 25-50 watt FM operation.

Good Operating Procedures

Have at least one spare charged battery with you at all times. Even two fully charged battery packs will not last more than 24 hours given heavy usage. Plan on a spare alkaline battery pack if your equipment has that capability; i.e., a spare pack that takes AA or AAA common alkaline batteries. Alternatively a spare 12V deep cycle portable battery (AGM preferred), or a portable propane powered AC generator and charge system to charge your batteries. A 50 or 100 watt portable solar system is an excellent adjunct to longer assignments when commercial power is not available. A 10 AH portable 12V Gel Cell also could be a good match for an extended deployment with a 5 watt HT or low power mobile radio.

Keep your batteries charged; but don’t overcharge your batteries. It is not difficult to create self-reliant emergency self-sustaining power with foresight.

Go kits and batteries

Have at least two recently charged spare battery packs for each radio in your go-kit (jump bag) and a split break-out system to feed two or more radios from the same source. Put at least a dozen alkaline batteries in your go-kit for your optional alkaline battery pack(s). Place an automobile charge adapter suitable for your radio(s) in your go-kit.